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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/715,841	11/19/2003	Akira Fuju	50002-017	3970
7590 05/18/2006 MCDERMOTT, WILL & EMERY 600 13th Street, N.W. Washington, DC 20005-3096			EXAMINER HANDAL, KAITI V	
			ART UNIT	PAPER NUMBER

1764

DATE MAILED: 05/18/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/715,841

Applicant(s)

FUJU ET AL.

Examiner

Kaity Handal

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☐ Claim(s) ____ is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-5 is/are rejected.
- 7) ☒ Claim(s) 4 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>3/2/2004</u> . | 6) <input type="checkbox"/> Other: ____. |

DETAILED ACTION

Drawings

Figure 6 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). Corrected drawings in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 1-5 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 1 recites the limitation "in each vertexes of the contour" in lines 11-12.

There is insufficient antecedent basis for this limitation in the claim.

Claim 1 recites the limitation "cross section is polygonal or wavelike" in line 6. It is unclear as to what the shape of the wave is.

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Claim 1 recites the limitation "an outermost pipe surrounding and inscribed by" in line 11, it is unclear as to whether the outer pipe is abutting with the outermost pipe.

Claim Objections

Claims 6-9 are objected to under 37 CFR 1.75(c) as being in improper form because a multiple dependent claim cannot depend from any other multiple dependent claim. See MPEP § 608.01(n). Accordingly, the claims have not been further treated on the merits.

Specification

Applicant is reminded of the proper content of an abstract of the disclosure.

A patent abstract is a concise statement of the technical disclosure of the patent and should include that which is new in the art to which the invention pertains. If the patent is of a basic nature, the entire technical disclosure may be new in the art, and the abstract should be directed to the entire disclosure. If the patent is in the nature of an improvement in an old apparatus, process, product, or composition, the abstract should include the technical disclosure of the improvement. In certain patents, particularly those for compounds and compositions, wherein the process for making and/or the use thereof are not obvious, the abstract should set forth a process for making and/or use thereof. If the new technical disclosure involves modifications or alternatives, the abstract should mention by way of example the preferred modification or alternative.

The abstract should not refer to purported merits or speculative applications of the invention and should not compare the invention with the prior art.

Where applicable, the abstract should include the following:

- (1) if a machine or apparatus, its organization and operation;
- (2) if an article, its method of making;
- (3) if a chemical compound, its identity and use;
- (4) if a mixture, its ingredients;
- (5) if a process, the steps.

Extensive mechanical and design details of apparatus should not be given.

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Applicant is reminded of the proper language and format for an abstract of the disclosure.

The abstract should be in narrative form and generally limited to a single paragraph on a separate sheet within the range of 50 to 150 words. It is important that the abstract not exceed 150 words in length since the space provided for the abstract on the computer tape used by the printer is limited. The form and legal phraseology often used in patent claims, such as "means" and "said," should be avoided. The abstract should describe the disclosure sufficiently to assist readers in deciding whether there is a need for consulting the full patent text for details.

The language should be clear and concise and should not repeat information given in the title. It should avoid using phrases which can be implied, such as, "The disclosure concerns," "The disclosure defined by this invention," "The disclosure describes," etc.

The specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1-2 are rejected under 35 U.S.C. 103(a) as being unpatentable over Komiya et al. (US 2002/0042035 A1) and further in view of Ohsaki et al. (US 4,909,809).

With respect to claim 1, Komiya teaches a hydrogen generator/reformer (fig. 1) comprising a reforming pipe/cylinder (62) comprising an erect inner pipe/cylinder (61); and an outer pipe/cylinder (62) surrounding said erect inner pipe/cylinder (61), a reforming catalyst layer (8) formed between the erect inner pipe/cylinder (61) and the outer pipe/cylinder (62), an outermost pipe/cylinder (63) surrounding the outer pipe/cylinder (62) and a passage/second gas flow path (50) of the reformed gas formed between the outer pipe/cylinder (62) and the outermost pipe/cylinder (63).

Komiya fails to show wherein said outer pipe/cylinder (62) has a cross section which is polygonal. Ohsaki teaches a reforming apparatus (figure 1) comprising an outer pipe/reactor (13) and a reforming catalyst bed (8) within, and wherein said outer pipe/reactor (13) has a hexagonal cross section in order to reduce the volume of the apparatus (col. 4, lines 11-15).

It would have been obvious to one having an ordinary skill in the art at the time the invention was made to include an outer pipe having a hexagonal cross section in Komiya's apparatus, as taught by Ohsaki, in order to reduce the volume of the apparatus.

With respect to claim 2, Komiya teaches wherein a fuel supplying part/raw material supply part (26) for supplying the fuel to the reforming pipe/cylinder (62); a water supplying part (20) for supplying the water to the reforming pipe/cylinder (62); a heating means/burner (18) for supplying a heat quantity necessary for a reforming reaction by burning a combustion fuel in a combustion pipe/partition (14) set inside of the erect inner pipe/cylinder (61) of the reforming pipe/cylinder (62); a heat

insulating means (53) for insulating the heat released from the reforming pipe/cylinder (62) at the outer periphery of the outermost pipe/cylinder (63); a CO transformer/shift layer (10) for making carbon monoxide contained in a reformed gas flowing out from the reforming pipe/cylinder (62) react with water and thereby to transform carbon monoxide and water into carbon dioxide; a CO eliminator/preferential oxidation catalyst layer (12) having an selective oxidation catalyst for making carbon monoxide contained in a transformed gas flowing out from the CO transformer/shift layer (10) react with air or oxygen to generate carbon dioxide, and a vessel (illustrated) for housing the above components, wherein the combustion pipe/partition (14), the reforming pipe/cylinder (62), the outermost pipe/cylinder (63), the heat insulating means (53), the CO transformer/shift layer (10), a first spatial portion/heating channel (48), the CO eliminator/preferential oxidation catalyst layer (12), a second spatial portion/cooling flow path (57), and the vessel are arranged in a concentrical circular way in order from the inside (illustrated).

5. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Komiya et al. (US 2002/0042035 A1), and in view of Ohsaki et al. (US 4,909,809), as applied to claim 2 above, and further in view of Sennoun et al. (US 2004/0047800 A1).

With respect to claim 3, Komiya as modified discloses all claim limitations as set forth above but fails to show wherein the quality and a thickness of the heat insulating material (53) are selected so as to be able to control the surface

temperature of the heat insulating material at 200 to 300°C. Sennoun teaches a reforming apparatus (fig. 1) comprising a cylindrical housing (30) and having an insulating material (not shown) (page 3, paragraph [0026]) and wherein a water gas low temperature shift reaction is conducted at a temperature below 300°C (page 5, paragraph [0040], lines 5-8) in order to enable the apparatus to be more energy effective (page 3, paragraph [0026]).

It would have been obvious to one having an ordinary skill in the art at the time the invention was made to include an insulating material which would enable a reaction temperature of 300°C in Komiya's modified reactor, as taught by Sennoun, in order to enable the apparatus to be more energy effective.

6. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Komiya et al. (US 2002/0042035 A1), and in view of Ohsaki et al. (US 4,909,809), as applied to claim 2 above, and further in view of Chahroudi et al. (US 4,259,401).

With respect to claim 4, Komiya as modified discloses all claim limitations as set forth above but fails to show wherein the heat insulating means is a mirror-surface heat insulating member and a quality, a thickness, and a surface finish state of the mirror-surface heat insulating member are selected so as to be able to control the inside of the CO transformer at 200 to 300°C. Chahroudi teaches an apparatus for storing heat comprising an insulating means comprised of a mirror-surface heat insulating material in order to reflect thermal radiation (col. 14, lines 40-43).

It would have been obvious to one having an ordinary skill in the art at the time the invention was made to include a heat insulating means comprising a mirror-surface in Komiya's modified reactor, as taught by Chahroudi, in order to reflect thermal radiation.

7. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Komiya et al. (US 2002/0042035 A1), and in view of Ohsaki et al. (US 4,909,809), as applied to claim 2 above, and further in view of Bruck et al. (US 2003/0027026 A1).

With respect to claim 5, Komiya as modified discloses all claim limitations as set forth above but fails to show wherein the heat insulating means is a vacuum space, and a thickness and a vacuum degree of the vacuum space are selected so as to be able to control the inside temperature of the CO transformer at 200 to 300°C. Bruck teaches a fuel cell installation having an operating temperature in the range of 80 and 300° C (page 3, paragraph [0048]) and comprising vacuum insulation in order to assure that the necessary operating temperature is reached as quickly as possible (page 2, paragraph [0035]).

It would have been obvious to one having an ordinary skill in the art at the time the invention was made to include a heat insulating means of a vacuum space in Komiya's modified apparatus, as taught by Bruck, in order to assure that the necessary operating temperature is reached as quickly as possible.

Conclusion

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kaity Handal whose telephone number is (571) 272-8520. The examiner can normally be reached on M-F 8-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Glenn Caldarola can be reached on (571) 272-1444. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

KH

4/27/2006


ALEXA DOROSHENK NECKEL
PRIMARY EXAMINER